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ABSTRACT

Prince George's Community College, in Maryland, has developed a typology of student academic outcomes which takes into account the possibilities inherent in an open enrollment student body. The outcomes in the typology are award and transfer; transfer/no award; award/no transfer; traditional achievers, a summary of these three outcomes; sophomore status in good standing; all achievers, combining traditional achievers and sophomores; persisters, or those still enrolled but not falling into the achiever categories; achievers/persisters; other exiters, or dropouts; and special motive students who had indicated a short-term goal. An application of this typology to the cohort of all 2,643 first-time students who entered in fall 1990 revealed that after 4 years: (1) 28% were classified as achievers; (2) 16% proved to be traditional achievers, with 2% earning awards and transferring, 4% earning only an award, and 10% transferring without an award; (3) 13% were sophomores in good standing, while another 7% were persisters; (4) 65% were classified as other exiters, while 10% were classified as special motive students; (5) when general success rates were calculated for various demographically defined sub-cohorts, Asians, Whites and foreign students tended to out-achieve African-Americans and Hispanics; and (6) students most likely to receive achiever status were those with stated transfer motives, non-developmental students, those averaging 9+ credit hours per major term, and those pursuing core transfer or technical professional degree programs. (KP)

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Tracking Student Progress at PGCC:

Basic Findings of the 1990 Entering Cohort Four Year Academic Outcomes Analysis

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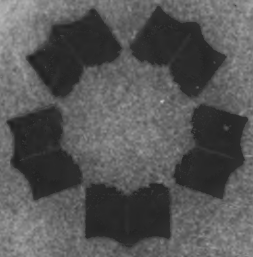

PRINCE GEORGES
COMMUNITY COLLEGE

Office of Institutional Research and Analysis

Enrollment Analysis EA96-7

June 1996

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PRINCE GEORGE'S COMMUNITY COLLEGE
Office of Institutional Research and Analysis

TRACKING STUDENT PROGRESS AT P.G.C.C.: BASIC FINDINGS OF THE 1990 ENTERING COHORT FOUR YEAR ACADEMIC OUTCOMES ANALYSIS

Enrollment Analysis EA95-7
June 1995

Introduction

The development of a practical typology of student academic outcomes which does justice to complex possibilities inherent in open enrollment student bodies has been a long term goal of the Office of Institutional Research and Analysis. We are pleased, therefore, to announce that we believe we have succeeded in producing just such a typology and have been able to apply it fruitfully in an analysis of the long-term behaviors of an important tracking group -- the cohort of all first time freshmen entering upon study at Prince George's Community College in the fall of 1990.

We will present our findings in three reports. The first, this report, will discuss the methodological considerations involved in developing a proper outcomes typology and provide a review of student four year academic outcomes according to the model we have developed (by whole cohort and basic student demographic/academic groupings). The second will trace the progress of cohort members toward those outcomes over time. And the third will report the results of a systematic multivariate analysis of Cohort outcomes in an attempt to understand the complex pattern of the correlates of student success at PGCC.

Developing an Outcomes Typology

Federal and state governments, accrediting agencies, college guidebook publishers, and others have focused on college graduation rates as a primary accountability measure. At open-admissions community colleges, with large proportions of students attending part-time, having goals other than degree completion, and needing remediation, such rates are often quite low. In addition, many students with goals of baccalaureate degrees and above transfer to senior institutions prior to completion of their community college programs. "Leaving early" for a senior institution does not represent a community college retention failure but

often a rational advancement toward the student's ultimate goal. Community college assessment measures that focus exclusively on graduation rates are misleading, as is increasingly recognized. For example, transfer to "a higher level program for which the prior program provided substantial preparation" has been included as a "completion" in Student-Right-to-Know calculations.

Inclusion of transfer in summary outcomes measures is not sufficient, however. *Conceptually*, what is needed is an outcomes typology that (1) is comprehensible and accepted as legitimate by legislators, accrediting agencies, the public, and all others colleges are appropriately accountable to; (2) takes into account the full range of student goals in attending college; (3) acknowledges student enrollment behavior patterns, including part-time and stop-out attendance; and (4) provides a meaningful summary of student accomplishment that is useful to campus policy makers.

In addition to the above conceptual guidelines, the construction of a realistic academic final outcomes typology should also be governed by two critical *pragmatic* criteria: (1) it should be operationalizable in terms of the sort of standard academic tracking data maintained by most community college student record systems, and (2) it should be utilizable within the framework of *cohort analysis* -- the most advanced academic progress methodology.

Considerations of convenience aside, the standard data criterion is important because of the need of community colleges to find and unite behind a common academic assessment mechanism which would both better reflect their unique enrollment and mission circumstances and better communicate them to the general public and local and national oversight agencies. The standard data criterion will allow a single typological approach to be followed by a maximum number of schools, promoting fairer, more readily comprehensible and nationally comparable institutional assessments.

Employing an academic outcomes typology supportable through cohort analysis is important because this would help put an end to the methodologically primitive and misleading "snapshot" assessment approach still favored by many oversight agencies. In the snapshot approach, a school is required to provide a "freeze frame" report on such things as the percentage of fiscal year X students earning associate degrees or the proportion of Spring Y enrollees with 30 accumulated credit hours. Precluding any analysis of the correlates and timing of academic progress, this method lumps native with transfer students, those in their first term of study with four year veterans, and in general pays no heed to process variables like study load and required remediation.

In cohort analysis, however, only the academic careers of first time students sharing the same fall semester entering date are followed until every cohort member has either achieved measurable final study objectives (e.g.,graduation or transfer to four year colleges or universities) or has ceased attendance without discernable results -- normally a process taking four to six years. Thus, a school's assessment results are based solely on students whose higher educational experience derives exclusively from attendance at the assessed school. Also, the potential duration of study and the impact of the environmental circumstances and academic policies in effect upon entrance have all been equalized. Furthermore, cohort data sets are typically organized on an enrollment and progress indicator term-by-term basis so that patterns of attendance and achievement can be tracked over time and systematically related to background variables (gender, race, etc.) and process variables (full time/part time, developmental placement, number of terms attended, etc.).

The PGCC Final Outcomes Typology

The Office of Institutional Research and Analysis has created a final outcomes typology, for both external accountability and internal decision support, which it feels embodies both the conceptual and pragmatic criteria just discussed:

1. **Award and transfer.** The percentage of students in an entering cohort who have earned a degree or certificate from the community college *and* transferred to a four-year college or university within the study period. Depending on where and how the transfer information is obtained, transfer rates may be underestimated. This is likely for colleges relying on state reporting systems since student transfer to independent colleges or colleges outside the state are often not including in state-mandated reporting systems.

2. **Transfer/no award.** The percentage of students identified as transferring to a senior institution without having earned an award from the community college.

3. **Award/no transfer.** The percentage of students earning a degree or certificate from the community college for whom there is no evidence of transfer. At institutions conferring a large number of certificates, a separate count for degrees and certificates might be warranted.

4. **Traditional Achievers.** A summary measure of the preceding three categories.

5. **Sophomore status in good standing.** The percentage of students who have

not graduated from the community college but who have earned at least 30 credits with a cumulative grade point average of 2.0 or above, and for whom we have no evidence of transfer. Given the large proportions of entering students needing remediation and/or attending part-time, reaching sophomore status in good standing represents a notable academic achievement. Probably included in this category are a number of students who have transferred to independent and out-of-state colleges or universities. This category may also be refined into *continuing sophomores in good standing* (those still taking courses through the last major term of the assessment period and whose final outcomes status remains pending) and *exited sophomores in good standing* (those leaving the college before the final term without a traditional academic achievement).

6. **All Achievers.** A summary measure combining traditional achievers with sophomores in good standing.

7. **Persisters.** The percentage of students still enrolled at the community college (as of the last term of the study period) who do not fall into any of the above "achiever" categories. They have not graduated or transferred, nor have they earned 30 cumulative credits with a 2.0 grade point average. As with those in the continuing sophomore in good standing group, the community college outcome for these persisters is yet to be determined.

8. **Achievers/Persisters.** A summary measure of all achiever categories plus persisters.

9. **Other Exiters ("Dropouts").** The percentage of students exiting the community college without graduating or earning 30 credits in good standing for which we have no evidence of transfer. Included in this group are the true "dropouts" who have not succeeded in reaching their goals within the study period. Some of these students may have transferred early (before accumulating 30 credits) to independent or out-of-state colleges, but most students in this group are appropriately considered as unsuccessful in achieving their academic goals at the college. Some refinement of this category can be achieved by dividing members into dropouts who abandoned study while maintaining a 2.0 or better G.P.A. and those who left PGCC without even a minimal passing grade average to show for their attendance.

10. **Special motive.** The percentage of students who had indicated short-term, non-degree goals of personal enrichment or job skill upgrading *and* who attended only during the first two terms of the study period. Note that

inclusion in this category requires both a stated short-term intention and behavioral evidence supportive of the stated student goal. Never intending to enter a curriculum or transfer, these students are properly excluded from attrition statistics.

Students may be classified using the above typology of seven outcomes categories and three summary percentages at any point in time beginning with the term following initial enrollment. But the classification becomes most meaningful when a substantial majority of the cohort has attained their ultimate community college outcome. While this argues for a fairly long study period, say six years or more, another consideration supports a shorter time span. Reporting on cohorts that entered many years ago runs the risk that student characteristics and institutional practices may have changed, so that the findings may not be useful guides for current policy making. OIRA plans regularly to report on how student cohorts break down according to the above typology at the end of three, four, five, and six years, with the four-year analysis the benchmark included in reports to our Board of Trustees and our state higher education commission. This report, reviewing the basic findings of the four-year benchmark analysis of Cohort 1990 student outcomes, is the first in the anticipated sequence.

To display long term trends in student outcomes across several entering cohorts, three student outcome rates will be calculated. Special motive students will be excluded in the calculation of all three rates, restricting the denominator that the rates will be based on to degree-seeking students, including those with early transfer goals. Thus, the student *success rate* means the percentage of degree-seeking students who have graduated or transferred within the study period. Similarly, the student *progress rate* is equivalent to the percentage of degree-seeking students who have earned 30 credits in good standing or who were enrolled in the last term of the study period. And, the student *exit rate* equals the percentage of degree-seeking students who have discontinued study at the community college without graduating, transferring, or attaining sophomore status in good standing.

Cohort 1990 Four Year Academic Outcomes

Cohort 1990 is the longest-standing group of students whose academic progress OIRA is currently tracking. Although the ideal period for final outcomes stock-taking is around six years, Cohort 1990 now has a history of sufficient duration (four years) to allow us to make a useful preliminary assessment of how well its

members fared overall in pursuing their educational objectives at PGCC.[1] Gauging Cohort 1990's academic outcomes at this point can take us a long way to understanding the degree and types of educational success experienced by students with exclusively PGCC initial academic careers.[2]

TABLE 1. COHORT 1990 FOUR YEAR ACADEMIC OUTCOMES

Outcome Categories	% Cohort Students		N
ACHIEVERS/PERSISTERS	***35***		***840***
ALL ACHIEVERS	28		673
All Traditional Achievers	16		372
Award & Transfer		*2*	*58*
Award/ No Transfer		*4*	*88*
Transfer/ No Award		*10*	*226*
Sophomores in Good Standing	13		301
Continuing thru Year 4		*6*	*144*
Exited by End of Year 4		*7*	*157*
PERSISTERS* (Other Continuing)	7		167
ALL OTHER EXITERS ("Dropouts")	***65***		***1,547***
In Good Standing		*26*	*618*
Not in Good Standing		*39*	*929*
TOTAL PROGRAM STUDENTS	***100***		***2,387***
SPECIAL MOTIVE STUDENTS	10		256
TOTAL COHORT STUDENTS	***100***		***2,643***

* Continuing through but not Sophomores in Good Standing

[1]A six year outcomes study of a PGCC first time freshman cohort formed in 1984 showed that fewer than one in twenty of its original members were still attending PGCC by the twelfth major semester of the cohort's existence. See *What Happened to the Class of '84: A Comprehensive Outcomes Assessment* (EA92-3, November 1991). By its eighth major term, Cohort 1990 retained as continuing students only 12 percent of its original members.

[2]Not all PGCC students, of course, have exclusively PGCC initial academic careers. By design, tracking cohorts include only first time freshmen and exclude students who transfer to PGCC from other post-secondary institutions.

Table 1 above provides a full academic outcome breakdown of Cohort 1990 students as of the end of the first 1994 summer term or after four years of potential study. Its rows represent the outcome categories just discussed, arranged logically by groups and subgroups. The four columns under the general heading *% Cohort Students* give the percentage of cohort students (rounded to the nearest digit) for each row outcome type; subgroup percentages (for example, Achievers 28 % and Persisters 7 %) always add up to the percentage shown for their corresponding parent category to the left (in this case, Achievers/Persisters 35 %). The large top section of the table (between the two thick separator lines) displays percentages based on the cohort's degree-seeking membership only (N=2,387); the 256 non-degree-seeking special motive students have been dropped from the base. The percentage for these, however, is displayed in the truncated bottom section under the second separator and is based on the entire cohort of 2,643 students.

According to Table 1, after four years around a third (35 percent) of Cohort 1990 degree-seeking students managed either to accomplish some sort of trackable substantial academic goal or at least to continue in their studies pending a final outcome in the future. Almost three in ten (28 percent) achieved either some traditional goal -- an associate degree, occupational certificate or letter of recognition, or transfer to a four year post-secondary institution (16 percent) -- or earned both sophomore status (30 or more credit hours) and a cumulative GPA of 2.0 or better (13 percent).

The largest group of Cohort 1990 Traditional Achievers were Transfer Only students (10 percent); the next largest category -- Award Only -- defined 4 percent of cohort degree-seekers. Only 2 percent of first time students entering in 1990 won both an award and a four year transfer within the eight major terms covered. Disregarding award and transfer category overlapping, 12 percent of Class of '90 in degree programs succeeded in transferring to a Maryland senior post-secondary institution, while 6 percent picked up an A.A. degree, occupational certificate or letter-of-recognition.

The 13 percent of degree-seeking students who earned sophomore in good standing status but neither transfer nor award over the study period divided into those still studying at PGCC towards a traditional academic goal (6 percent) and those who exited before the last major term tracked (7 percent). Another 7 percent of cohort program students -- the Persisters -- were continuing their PGCC attendance through Term 8 but had not yet earned sophomore in good standing status. Thus, the total percentage of all PGCC continuing students among degree-seeking cohort members proved to be 13 percent.

But by far the largest number of cohort members fell into the All Other Exiters category. Those who discontinued their studies at PGCC before graduating, transferring or accomplishing sophomore in good standing status represented almost two-thirds (65 percent) of all degree-seeking students. This proportion divided into 26 percent who maintained a passing grade average up to leaving PGCC, and 39 percent who left with a failing GPA.

Interpreting the Outcome Model Results

Great caution should be exercised in interpreting the outcome results just reviewed; especially, the data are inappropriate for drawing summary conclusions concerning typical achievement and dropout rates at PGCC. The OIRA outcomes model does not pretend to give a definitive account of academic outcomes phenomena. Its practical aim is simply to provide a useful sense of the level of aggregate student achievement using the best defined outcomes categories possible given the somewhat restrictive student tracking data readily available to Maryland community college institutional research offices.

In particular, the data used to identify students who transfer to other post-secondary schools is quite limited in the scope of the behaviors covered. To measure transfer levels, Maryland community colleges must rely upon data supplied by the Maryland Higher Education Commission's Transfer Student System. TSS, at present, is set up to track only the most common form of Maryland community college transfer -- to Maryland state four year colleges and universities -- and then only in cases involving the transferral of at least 12 credit hours from previous schools. This leaves a whole range of transfer possibilities out of the picture -- to Maryland public four year schools in cases involving fewer than 12 credits, to Maryland private four year institutions, to out-of-state four year colleges and universities, and even to other community colleges, private junior colleges and proprietary occupational training centers.

We know that these latter kinds of transfer must occur among exiting PGCC students but such non-TSS types of transfer are hidden from us when it comes to identifying them for the outcomes model used in this study. Thus it is certain that our outcome model underestimates the full frequency of the transfer occurrences to some unknown extent. Furthermore, given the logic of our model, *underestimation* of transfer frequency leads inevitably to *overestimation* of the frequency of exiting without a traditional achievement. The reason is that all students whose academic achievement consists solely of a non-TSS type of transfer will appear under the lens of the model merely as some variety of exiter -- exiting sophomore in good standing, exiter in good standing but short of 30 credit hours or exiter with no discernable academic accomplishments whatsoever.

Fortunately, it is possible to get a rough sense of the degree of these over- and underestimates through a re-analysis of the data drawn from a 1990 attitude survey of a previous entering freshman cohort (1984), the questionnaire of which included items allowing for respondent unrestricted self-reporting of transfer by type.[3] After testing for comparability and concluding that the 1984 cohort sample provided a reasonable 1990 cohort surrogate for loosely estimating non-TSS type transfer rates,[4] we conducted an analysis which found that including these along with TSS transfer types doubled the overall rate of transfer to four-year schools -- from 15 to 30 percent: 4 percent reported transfers to Maryland public institutions with less than 12 credits, 2 percent to Maryland private and 9 percent to out-of-state schools.

Furthermore, we discovered a significant level (12 percent) of self-reported transferal to other community colleges, private two-year schools and proprietary occupational training institutions. Such transfers represent a real but lesser form of transfer behavior, a sort of "continuing elsewhere" category.

The impact on exiting student outcome assessment made by taking into account the whole range of transfer possibilities can be gauged by reviewing Table 2. This displays 1984 cohort sample outcome results by a "full knowledge" version of our outcome paradigm. The Non-Achieving Exiter category, which defines 60 percent of the sample when "hidden transfers" are included, is shown reduced by more than a third -- to 38 percent -- when transfers are properly distributed; and the least academically successful group, Exiters with neither good standing nor sophomore status (the classic Dropouts), are shown here representing about a quarter (24 percent) of sample degree-seeking students rather than the over one-third (36 percent) the category would have contained had non-TSS transfer not been appropriately relocated.

Respondent self-reported outcomes are typically biased toward the positive and the 1984 cohort assessment period covered two additional years. Therefore, the above Cohort 1984-based estimates of transfer and dropout rate, applied to the Cohort 1990 case, are probably too high. Most likely, had we hard data on the whole

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[3] See *What Happened to the Class of '84: A Comprehensive Outcomes Assessment* (Enrollment Analysis EA92-3, November 1991) for a complete report on the survey methodology and results of the original analysis.

[4] The test involved distributing degree-seeking Cohort 1984 sample members into the exact same outcome categories shown in Table 1 (including limiting transfer student designation solely to those transferring 12 or more credit hours to a Maryland four-year public post-secondary institution),and comparing the resulting percentages to those for the 1990 cohort. They proved to be remarkably similar even though the sample data related to a cohort preceding the one under study by six years and was set up for a twelve term rather than eight term assessment of academic outcomes.

range of transfer possibilities for their calculation, actual Cohort 1990 four-year transfer and dropout rates would have proven to fall somewhere between those indicated by Tables 1 and 2. In the real world, however, such data were not available for Cohort 1990 outcomes assessment and will not be available for future cohort outcome assessment for some time to come if ever. In the absence of full transfer tracking, the Achiever category of our outcomes model remains capable of providing a useful, *conservative* estimate of community college student academic attainment.

TABLE 2. COHORT 1984 ACADEMIC OUTCOMES REFINED ON THE BASIS OF COMPLETE TRANSFER INFORMATION

Refined Outcome Categories	% Prog. Students
Traditional Academic Achievers	40
4-Year Transfer Only	*24*
*4-Year Transfer and Award**	*6*
Award Only	*10*
Other Achievers or Pre-4-Year Continuing Students	22
Continuing Elsewhere/Other Transfers	*11*
Continuing at PGCC/Sophomore in Good Standing	*2*
Exiter/Sophomore in Good Standing	*6*
Persister/Other Continuing at PGCC	*3*
Non-Achieving Exiters	38
with less than 30 Credits but GPA 2.0 or better	*14*
with less than 30 Credits & GPA < 2.0 ("Dropouts")	*24*
TOTAL PROGRAM STUDENT %	100
TOTAL PROGRAM STUDENT N	486

* Includes .6 % who transferred to 2-year institutions

Achievement by Student Groups

OIRA ran a series of cross-tabulations relating Cohort 1990 four-year outcomes with selected common student background and academic status variables, and found, not surprisingly, that there existed significant variations in achievement levels across student groups. Table 3 summarizes the results:

TABLE 3. COHORT 1990 SELECTED FOUR YEAR OUTCOMES BY VARIOUS STUDENT SUBSAMPLES

Background & Academic Variables [Category N]	% Transf	% Award	% Award/ Transf	% Soph Only*	% Achiever	*Eta*** with Achiever	% Continuing
<20 Years Old [1,536]	16	7	20	14	35	.190	12
20 - 24 [410]	5	4	8	9	17	--	12
25 +[441]	3	4	6	11	17	--	19
Female [1,380]	13	5	16	11	29	.030	15
Male [1,007]	11	7	16	14	27	--	10
African American [1,181]	5	4	8	9	17	.258	14
Hispanic [52]	4	0	4	17	21	--	13
Asian [73]	29	8	33	10	43	--	8
White [896]	20	10	25	16	41	--	12
Foreign Student [174]	11	3	13	24	37	--	17
Avr 9+Term Load [1,331]	20	10	25	16	41	.328	11
<9 Hrs/ Major Term [1,056]	2	2	3	8	12	--	16
T1 Dev. Students [1,249]	5	5	8	15	19	.222	14
Non-Dev. Students [1,138]	19	9	24	11	39	--	12
AA Goal [1,070]	10	7	14	14	28	.076	15
Certificate Goal [318]	7	7	11	10	20	--	14
Just Taking Courses [999]	16	6	19	12	31	--	10
Transfer Reason [1,510]	16	6	20	14	34	.186	12
Immediate Career [378]	5	8	11	10	20	--	11
Explore Career/Subject [352]	4	3	6	8	13	--	11
Update Job Skill [79]	4	10	11	10	22	--	32
Personal Enrichment [62]	5	3	8	16	24	--	29
Trs-AA/Core Curr.[226]	24	6	27	12	39	.219	8
Trs-AA/Other Curr. [1,077]	15	5	17	12	30	--	10
Occ-AA/New Col Curr [193]	11	22	26	19	46	--	17
Occ-AA/Bus, Oth Curr [453]	6	5	10	18	28	--	25
Occ.-AA/Trade Curr. [279]	5	4	9	9	17	--	9
Special Curr/Unmat [159]	2	0	2	0	2	--	8
PROG STUDENTS [2,387]	12	6	16	13	28	--	13

NOTE: % Transfer and % Award column categories overlap; % Continuing and % Sophomore columns overlap

* Sophomore (30+ credit hours) in Good Standing, either continuing or exited/ No Transfer or award

Social Background. Among the three student social background variables selected, race/ethnicity showed the highest bivariate correlation with academic achievement (*eta*[5] = .258). Of the five racial groups tested,[6] Asians had the highest collective rate of general achievement (43 percent, or 154 percent of the whole cohort average), of traditional academic achievement (33 percent or more than twice average) and of transfer to Maryland four-year public colleges (29 percent, almost three times the cohort rate). White students proved to be next in group general achievement (41 percent) and showed both strong transfer tendencies (20 percent, nearly twice average) and graduation tendencies (10 percent, nearly twice average).

An above average percentage of foreign students (37) also made it into the general achievement category, but most of this success resulted from a high disproportion of sophomores in good standing but without award or transfer (24 percent, nearly twice average). Both African American and Hispanic groups fell considerably below the general achievement cohort mean of 28 percent (17 and 21 percent, respectively), as well as registering sub par rates in all specific achievement categories.

Age (taken at the time of cohort formation) was revealed as the second strongest social background predictor of general achievement (*eta* = .190). Younger degree-seeking cohort members (those under 20 years old) tended to out-achieve 20-24 year olds and those 25 and over by two to one (35 percent to 17 percent for both older groups). Very few students over 19 years old managed to transfer (20-24 year olds, 5 percent; 25 + students, 3 percent) or graduate (both 4 percent). In addition, 25 + students show a distinct above average tendency to linger over their studies through the eighth term (19 percent).

Student gender, the third background variable tested as a predictor of success, basically failed to discriminate achievers from non-achievers (*eta* = .030). Only a 2 percent achievement difference existed between Cohort 1990 men and woman after four years of effort.

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[5] The *eta* coefficient is the most appropriate correlation measure for use when one is gauging the overall strength of relationship between a causal categorical variable and a dependent dichotomous variable (e.g., achiever = 1/non-achiever = 0). *Eta* varies from 0 (random or no relationship) to 1 (maximum possible relationship).

[6] Only 7 cohort members turned out to be Native Americans, too few for analysis.

Academic Process. Five academic process variables were examined as predictors of student success: average major term credit hour load,[7] developmental program placement,[8] last term self-reported academic goal of PGCC study, last term self-reported reasons for PGCC attendance,[9] and final semester curriculum choice.[10]

The process variable most highly correlating with academic achievement proved to be study load (eta = .328). Cohort 1990 members with average term study loads of 9 or more credit hours were almost four times more likely either to graduate, transfer to a four year school or make sophomore in good standing status within four years of beginning college work than those with mean study loads lower than 9 credit hours (41 to 12 percent, respectively). This disparity was even more noticeable when we focused on traditional academic achievement categories: high load students outperformed lower load students five-to-one in earning a PGCC award (10 to 2 percent, respectively) and ten-to-one in rate of transfer (20 to 2 percent, respectively).

Placing or not placing into a remedial program in one's first semester was the next most achievement predictive process circumstance (*eta* = .222). Developmental students were only about half as likely to graduate, transfer or make sophomore in good standing status than non-developmental students -- 19 to 39 percent, respectively. Furthermore, whereas most of the non-developmental achievers fell into the traditional success (graduation/transfer) categories (24 of 39 percent), most developmental students concentrated in the sophomore in good standing category (15 of 19 percent).

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[7] Based on a term-by-term total credit hours attempted variable which treated developmental courses as regular credit courses.

[8] Students who prior to beginning first term study placed into one or more remedial programs (whether or not they took all three elements of the placement examination: reading, English usage, mathematics) versus those either placing out of all developmental courses or who declined placement testing.

[9] Study goal and attendance reason responses to two registration form single-option questions.

[10] Student curriculum choices were grouped according to the following scheme: transfer associate degree program core curriculum (Arts and Sciences, Engineering and Computer Science, Education); all other transfer degree program curriculum choices, including General Studies; occupational degree programs featuring preparation for the technical ("New Collar") professions (Nursing, other Allied Health, Criminal Justice, Paralegal); occupational degree program in business-related studies (Business Management, Accounting, etc.); occupational degree programs leading to employment in the trades and service industries (Drafting, Electronics, Hospitality Management, Construction Management, etc.); special curricula (early admission, concurrent study, non-program, etc.).

According to Table 3, curriculum choice was almost as good a predictor of Cohort 1990 four-year achievement as developmental placement (*eta* = .219). The two highest achieving curriculum groups were students in core transfer associate degree programs (39 percent) and those in occupational degree programs centering on "New Collar" career preparation (46 percent). These two relatively successful groups, however, differed in some interesting ways. Core transfer program students were far more likely to have earned their achiever designation by four-year school transfer compared with "New Collar" occupational program students (24 to 11 percent respectively); furthermore, additional analysis showed that most core transfer program students who left for four year colleges and universities did so without graduating (21 percent). "New Collar" occupational degree students, on the other hand, seemed to excel mostly in earning associate degrees and certificates; 22 percent were award winners, the highest proportion for any group displayed in the table. We may also add that the great majority of these (16 percent) were "award only" achievers.

Students in other transfer degree programs and those in business-related occupational degree programs exhibited success rates around average for the whole cohort, the former somewhat favoring traditional types of achievement, the latter sophomore in good standing status. Business-oriented occupational cohort members proved special, however, in their exceptional representation in the continuing student category (25 percent -- nearly twice average). Students with trade oriented majors seem to have the hardest time making academic progress of any formal program group in Cohort 1990; only 17 percent of them were classifiable as achievers. And bringing up the rear, not unexpectedly, were students in special program circumstances (concurrent enrollees, gifted and talented program, etc. and those regular students with serious study intentions who failed to matriculate in a standard degree program before leaving PGCC). In four years, only 2 percent managed to make significant academic progress as we are measuring it.

Inferred Socio-Economic Status

National educational research universally has found many important links between the social class backgrounds of students and academic performance. Most universities and colleges, however, have not been able routinely to explore these links on their own campus because of problems involved in gathering data in such sensitive areas as student income, level of employment, parental educational achievement and the like. Fortunately, PGCC is one of the few which has the capability to do class analysis. The enabler is the college's proprietary geo-demographic targeting system -- *PG-TRAK*[90] -- which, among other things, can assign each student into one of the fifteen neighborhood lifestyle clusters which define the socio-economic make-up of Prince George's County using only residential address data.

To get a sense of the interaction between student social class and academic performance for this study, OIRA used *PG-TRAK*[90] and Cohort 1990 member address data to successfully cluster-classify the great majority of the cohort's degree-seeking students (n = 2,165)[11]. We then related student cluster identity to four-year academic outcomes, with the results show below:

TABLE 4. COHORT 1990 SELECTED FOUR YEAR OUTCOMES BY **PG-TRAK**[90] *LIFE-STYLE CLUSTERS (Eta with Achiever = .211)*

B-Level Cluster Blocks* [Cluster N]	% Transfers	% Awards	% Award/ Transfer	% Soph Only**	% Achiever
VERY WELL-OFF WHITE	23	8	26	16	42
03-Beltway Havens [120]	23	6	26	24	50
01-Exurban Elite [292]	24	10	27	13	40
08-Cosmopolitans [74]	23	4	23	15	38
WELL-OFF MIXED	13	7	17	13	30
12-Old P.G. County [67]	19	2	21	14	34
06-Rural Development [270]	9	9	16	14	30
04-Upward Mobiles [248]	15	7	19	11	29
02-Black Enterprise [146]	12	7	16	13	29
LOWER MIDCLASS MIXED	9	5	13	12	26
14-Ethnic Mix [117]	8	3	11	15	27
05-Black Mid-America [263]	10	7	15	11	26
11-Minority Comers [117]	10	3	12	13	25
POORER BLACK	5	4	8	9	17
13-Blue Collar Blacks [223]	6	4	8	11	20
15-City Line [228]	3	4	7	7	14
PROG STUDENTS [2,387]	13	6	16	13	29

NOTE: % Transfer and % Award column categories overlap

* Un-cluster-codible students n = 257; two clusters proved to have subsample sizes under 20 students (7-Ft. George and 10-Town & Gown); these were amalgamated with the larger clusters they most resembled -- 6-Rural Development and 8-Cosmopolitans, respectively.

** Sophomore (30+ credit hours) in Good Standing, either continuing or exited/ No Transfer or award

[11] For a quick reference description of the cluster blocks discussed in this study, see PG-TRAK[90] -- *Prince George's Community College's Lifestyle Cluster Marketing System: Introduction and Ready Reference* (Marketing Analysis MA93-1, November 1992); for an extended introduction to *PG-TRAK*[90], see *What is* PG-TRAK[90]*?: An Introduction to PGCC's Lifestyle Cluster System for Student Recruitment and Enrollment Analysis* (Marketing Analysis MA94-1, August 1993).

Table 4 is organized according to the overall achievement levels of cohort members by neighborhood cluster blocks. Unshaded table rows represent individual student clusters, ordered by collective academic performance from highest to lowest; the four shaded rows mark off four socio-economic groupings of similar clusters to ease interpretation and display group performance means.

The result was the discovery of a modest relationship between student "social class" as measured by the socio-economic character of student residential neighborhoods and general academic achievement at PGCC -- *eta* = .211. Cluster achievement rates varied from 50 percent (Beltway Havens -- an aggregation of affluent, managerial suburban neighborhoods spread along side the Capital Beltway) to 14 percent (City Line -- poor working class neighborhoods bordering the District of Columbia), and the downward performance variation, as the grouped cluster performance data indicate, fairly closely followed inferred student social class gradations. About four of ten (42 percent) cohort members in the extremely well-off, mostly white grouping classified as achievers, three in ten (30 percent) of those from the merely well-off white and minority neighborhoods constituting the next grouping down in class rank, around a quarter (26 percent) of students from lower middle class areas of the county, and fewer than one in five (17 percent) of degree-seekers from the predominantly minority, working class districts.

The table also suggests that transfer tendency may be the most social class-responsive component of academic achievement: 23 percent of top grouping students managed to jump to a four-year Maryland public college or university, almost double the rate for students in the second class grouping (13 percent). In fact, students from Beltway Havens, Exurban Elite and Cosmopolitan neighborhoods generated 41 percent of all transfers by cluster-coded cohort members seeking degrees, although these students constituted only 22 percent of all cohort degree-seekers.

Interpreting Achievement Correlates

Explaining why certain student behaviors or characteristics are predictive of academic success is a tricky business. Sometimes, as with the academic process variables we employed, interpretation seems quite straight-forward. Cohort members whose stated study goal was transfer to a four-year school thereby gave *prima facie* evidence of high transfer motivation, and indeed, we found their measurable actual tendency to transfer about three times that of students with other goals. And it came as no surprise that cohort members in transfer AA programs, which aim students toward four-year baccalaureate programs, also showed a disproportionate transfer tendency as a group -- double the norm. Similarly, it is easy to explain the extra-high graduation rate of students majoring in the technical professions, like nursing, when one considers that earning an associate degree in any of these fields is an essential

step toward career credentialization. And, there are obvious explanations for the differing performance of study load and developmental placement groups as well. It is quite plausible to trace the relatively low achievement level of students averaging less than 9 credit hours per major term to prolonged attendance and study discontinuities, while relatively poor progress among developmental students might easily be the result of inadequate college preparation and delayed credit program study.

Pinpointing the reasons for differential academic attainment across social background groups is automatically more difficult. Predictors like ethnicity, age and gender are not intrinsic to the educational process (hence the term *background* variable), and interpretation of their impact on academic performance often requires making use of general and sometimes controversial theories of sociology and psychology.

Furthermore, background variables by their very nature are quite prone to what statisticians call *spurious correlation* -- directly linking with another variable only in appearance, not in reality. For example, our data appear to show younger cohort members definitely out-achieving older members(age with achievement, *eta* = .190), with those under 20 years of age twice as likely to classify as achievers after four years. Deeper analysis, however, indicated that cohort student age had almost nothing in itself to do with academic attainment. When we controlled for the possible interfering effects of study load differences, the seeming relationship collapsed: age by achievement for 9+ credit load students, *eta* = .045; for less than 9 credit load students, *eta* = .044. Put another way, students who had similar study loads had very similar probabilities of academic success, regardless of age. The true story turned out to be that high study load correlated strongly with both younger age (eta = .476) and with academic achievement (eta = .328). Age only seemed to predict achievement because many more younger students tended to opt for high study loads than older students did, and since those with high study loads, young or old, tended strongly to achieve, the success category swelled with a higher proportion of younger students.

As this example clearly indicates, the road to academic achievement is a complicated one, as complex as the academic process itself. Typically, social background variables like student age have their impact on student achievement indirectly through intervening process variables like study load. This would include student race which as we will see in a future report interacts strongly with developmental placement.

But academic process variables interact in critical ways as well because each process variable is structurally linked with all others in a general system featuring many branching points. To take one stream, the developmental placement

examination classifies students as developmental or non-developmental, students required to take developmental courses may either complete their remedial work or not, students completing their developmental program may go on to degree program study while non-completers are locked out of most credit course-taking. And at each branch point, the effects of background variables (e.g., student race) and other academic process variables (e.g., credit hour load) may be at work. The general question "What is the academic achievement rate of developmental students?" may be far less important to answer from a policy standpoint than process-centered questions like: Do certain racial groups place into remedial programs more than others? What correlates with completing developmental programs? Do students completing their remedial work graduate and transfer with the same frequency as do non-developmental students? And how does study load affect a developmental student's academic attainment?

In the third report in this series on the four-year progress of Cohort 1990 students, we will attempt the kind of systematic analysis of the social background and academic process correlates of student achievement capable of answering these and other questions which take the complexity of the community college learning process seriously.

Summary and Conclusion

Using simple percentage analysis of data drawn from the fall 1990 first time entering student cohort and a new OIRA paradigm of student final study outcomes, a four-year assessment was carried out, with the following main findings:

- Not quite three in ten degree-seeking students (28 percent) managed within four years to classify as **achievers**. The achiever category broke down into two sub-categories:

- Around 16 percent proved to be **traditional achievers** -- **award earners** (6 percent) and/or **transfer students** (12 percent). Award earners were students who picked up either an associate degree, certificate or letter-of-recognition within four years; transfer students were limited only to those who brought over at least 12 PGCC credits to a Maryland four-year public post-secondary institution.

- The second achiever sub-category consisted of students who did not earn an award or transfer within four years but did manage to progress to **sophomores in good standing** status (13 percent), having accumulated at least 30 credit hours while maintaining a 2.0+ GPA. About 6 percent were continuing students who might still graduate or transfer in the future; 7 percent stopped attending PGCC before the four years were up.

- In the non-achiever camp, 7 percent of the degree-seeking cohort members proved to be **persisters** -- continuing students lacking sophomore in good standing status. When continuing sophomores in good standing are added to these, the total fourth year continuing students proportion comes to 13 percent.

- **All other exiters** represented almost two-thirds (65 percent) of all degree-seeking cohort members. Over a quarter (26 percent) of the cohort left PGCC with a passing grade average; nearly two-fifths (39 percent) ceased attendance without even an adequate GPA to show for their effort. This last group is likely to contain most of the true dropouts -- students academically unequipped to pursue college studies.

- When general success rates were calculated for various demographically-defined sub-cohorts, we found Asians, whites and foreign students tended to out-achieve African Americans and Hispanics, students under 20 years of age more frequently ending up graduating, transferring or becoming sophomores in good standing, but little if any academic attainment difference between men and women. There was also a positive relationship between achievement likelihood and the socio-economic status of student home neighborhood.

- Achievement rate also varied by academic process variables: Most likely to have earned awards, transfer or sophomore in good standing status within four years were students with stated transfer attendance motives, non-developmental students, those averaging 9+ credit hours per major term, and cohort members choosing to pursue core transfer degree or technical professional degree programs.

Two cautions must be made regarding the interpretation of these findings. First, a separate outcomes analysis of a comparable, earlier cohort suggested that the Cohort 1990 outcome rates given here may under-represent the true extent of transfer behavior at PGCC by upwards of 100 percent and overstate the Other Exiter category by as much as 50 percent. The problem results from the very restrictive definition of transfer student forced on us by the state transfer tracking system which supplies our data on inter-school movement. TSS does not report four-year private college or out-of-state transfers, among other legitimate varieties of transfer.

Second, the raw achievement rates presented for various demographic and academic process sub-cohorts may be very misleading if taken at face value. The community college learning process is highly convoluted and one cannot properly comprehend what genuinely makes for student achievement unless one takes into account how a myriad of background and process factors interact with each other

over time in a complex web of academic causality. An in-depth, multivariate approach must be taken with the data in order to weigh the true impact of the causal variables involved in predicting academic achievement. Such research is already underway and a report of its findings is forthcoming.

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